The organisation of an ophthalmological service for diabetics in a teaching hospital

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Summary

A new system of ophthalmological evaluation of diabetic patients in a teaching hospital has been devised. All the patients attending the diabetic clinic were screened by ophthalmologists. Any patient with a problem was then referred to a diabetic ophthalmology clinic where a full evaluation was done and treatment given where necessary. In an 18-month period 1 015 new ophthalmological diabetic patients were screened. Of these patients 13,6% had background retinopathy, 8,4% pre-proliferative retinopathy and 3,4% proliferative retinopathy, while 8,6% had maculopathy. These results show that even in a teaching hospital a significant percentage of patients already have pre-proliferative or even proliferative retinopathy when seen by an ophthalmologist for the first time. The importance of organising an ophthalmological service for the diabetic patient is stressed.

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Diabetic retinopathy remains one of the most serious and frequent causes of blindness.[1] Within recent years the treatment of diabetic retinopathy and of more advanced complications of retinopathy has been improved by the introduction of photocoagulation and vitrectomy. The most severe complication of diabetic retinopathy, destruction of vision, can at least be postponed by these therapeutic procedures. Early detection and demarcation of patients at risk is thus of vital importance.[1]

The treatment of the ophthalmic diabetic patient has five facets,[2] namely: (*i*) metabolic control; (*ii*) organisation of ophthalmological service; (*iii*) laser photocoagulation; (*iv*) microsurgery of posterior segment; and (*v*) low visual aids.

Before this study diabetics at Tygerberg Hospital were seen and evaluated by general practitioners and physicians. When eye disease was noted the patients were referred to the Department of Ophthalmology where they were treated by various clinical assistants. This system left much to be desired as some patients who were seen for the first time at the Department of Ophthalmology presented with advanced retinopathy despite being seen regularly at other clinics. This problem was aggravated by the fact that diabetic retinopathy may not affect the macula early, so that a patient may have no symptoms until the condition is moderately advanced. It was also apparent that a certain inability to diagnose diabetic retinopathy through an undilated pupil existed among our non-ophthalmological colleagues.[3,4]

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Because of the multisystemic nature of diabetes, the diabetic must be seen by a multi-disciplinary team — physician, diabetic nurse, dietitian, social worker, optometrist, ophthalmologist and others. It is essential that this team be well co-ordinated to ensure the highest quality of care for diabetics.

We decided to pay attention to the second facet of ophthalmological diabetic care and to try to improve the organisation of the ophthalmological service to the diabetic patient.

Patients and methods

In June 1984 a new system for registering diabetics was introduced at Tygerberg Hospital. The patient registered at reception and thereafter attended a diabetic information lecture and problem-orientated discussion at the Diabetic Education Centre which was led by a diabetic nursing sister and dietitian.

Immediately after the lecture each patient's details were entered on the Department of Ophthalmology Diabetes Clinic form and thereafter their fundi were evaluated by an ophthalmologist. Evaluation of the fundi took place in a specially darkened room in the Diabetic Education Centre through undilated pupils (pupils were not dilated at this initial screening because of possible angle closure and inconvenience caused to patients by reduced visual acuity).

Patients who fell into one of the following categories were referred to the Department of Ophthalmology Diabetic Clinic: (*i*) any evidence of retinopathy; (*ii*) fundus not readily visible; (*iii*) high-risk patients such as those with diabetes of long duration (5 years or more in diabetics over 40 years of age and 10 years or more in diabetics under 40 years of age); and (*iv*) poorly controlled diabetics.[5,6] Patients with no diabetic eye disease were re-evaluated on a yearly basis at the Diabetic Education Centre.

After they had attended the Diabetic Education Centre, the patients were seen by a physician and attended other clinics, such as surgical, dietetic, renal, etc. An appointment at the Department of Ophthalmology Diabetic Clinic was usually made to coincide with the patient's next appointment at the hospital, so the patient would be seen in the afternoon after attending other clinics. However, if it were deemed necessary, the patient was seen at the Department of Ophthalmology Diabetic Clinic on the same day.

In the Ophthalmology Department the patient was fully evaluated with regard to visual acuity, a complete examination of the adnexae and anterior segment was performed and the intra-ocular pressures were recorded. A complete examination of the vitreous humour and retina through dilated pupils was carried out. Retinopathy, when present, was classified as follows, using the worse eye where there was a difference (on the assumption that the worse eye reflected more accurately the microvascular status of the patient): (*i*) background retinopathy — the presence of venous congestion, micro-aneurysms, hard exudates and/or scattered dot and blot haemorrhages; (*ii*) pre-proliferative retinopathy — the presence of signs of capillary non-perfusion such as cotton-wool spots, intraretinal microvascular abnormalities, venous loops, beading and widespread dot and blot haemorrhages; and (*iii*) proliferative retinopathy — the presence of neovascularisation or of complications of neovascularisation such as vitreous haemorrhage, tractional retinal detachment, etc.[7]

The above forms are distinct phases in the progression of the disease and are important therapeutically. For example, background retinopathy requires regular re-evaluation only, while proliferative retinopathy needs to be treated urgently either by photocoagulation or by posterior segment surgery in the more advanced cases.

There exists a high risk of neovascularisation in eyes with pre-proliferative retinopathy and these patients therefore need to be re-examined more regularly.

Patients in any of the above three groups can also have maculopathy. Maculopathy was defined as vascular leakage, exudation and/or capillary closure involving or threatening to involve the macula. Maculopathy was classified as follows:[8-10] (*i*) focal — exudates usually circinate in nature or forming the arc of a circle with micro-aneurysms or groups of micro-aneurysms in the centre involving or threatening to involve the macula; (*ii*) oedematous — associated with capillary dilatation and leakage and marked oedema of the macula, sometimes with micro-aneurysms, haemorrhages, exudates and even cystic retinal changes; and (*iii*) ischaemic — associated with areas of retinal non-perfusion, although haemorrhages, oedema and exudates may also be present along with cystoid oedema. It is important to distinguish between the three types of maculopathy before deciding on therapy as the first type has been shown to respond well to photocoagulation, whereas the oedematous and ischaemic types do not.

Fluorescein angiography was not done routinely (owing to a shortage of staff), but only when necessary to differentiate between the three types of maculopathy, or to diagnose early neovascularisation. The required treatment was then initiated, further treatment being dictated by the relevant pathological condition. An effort was made to co-ordinate future appointments at the Ophthalmology Department with appointments at the various other clinics. The evaluation and treatment of patients in the Ophthalmology Department Diabetic Clinic was performed by the same ophthalmologist who had carried out the initial screening procedure in the Diabetic Education Centre. A diabetic meeting was held once a month at which problem areas were discussed by the staff involved in the care and treatment of diabetics and lectures were given by staff members in the various disciplines.

All diabetic patients admitted for control of their diabetes were referred to the Ophthalmology Department Diabetic Clinic and fully evaluated as described. All pregnant diabetics in the hospital were evaluated in a similar manner. In the 18-month period from June 1984 to December 1985, 1 015 diabetic patients were evaluated as outlined above. These patients had not previously been seen by an ophthalmologist and excluded those already receiving treatment from an ophthalmologist. Included in this group were 34 pregnant diabetic patients.

Results

Of the 1 015 patients evaluated, 757 (74,6%) had no retinopathy, 138 (13,6%) had background retinopathy, 85 (8,4%) had pre-proliferative retinopathy and 35 (3,4%) had proliferative retinopathy. Six hundred and eighty-five (67,5%) of the patients evaluated were females, and 330 (32,5%) were males. There were 257 males and 500 females in the non-retinopathy group, 38 males and 100 females in the background retinopathy group, 23 males and 62 females in the pre-proliferative retinopathy group, and 12 males and 23 females in the proliferative retinopathy group.

The female group included 34 pregnant diabetics. Of these, 28 had no retinopathy, 4 had background retinopathy, 2 had pre-proliferative retinopathy and none had proliferative retinopathy.

Eighty-seven of the above patients (with some retinopathy) also had maculopathy (8,6% of the total). Of these 22 were males and 65 females. Seventy-two had focal maculopathy, 12 had ischaemic maculopathy and 3 had oedematous maculopathy (Table I).

TABLE I. CLASSIFICATION OF PATIENTS WITH MACULOPATHY

Type of maculopathy	Male	Female	Total
Focal	**21**	**51**	**72**
Ischaemic	**1**	**11**	**12**
Oedematous	**0**	**3**	**3**
Total	**22 (2,2%)***	**65 (6,4%)***	**87 (8,6%)***

*Percentage of total number of patients.

Discussion

It is evident that when seen for the first time by an ophthalmologist, even in a teaching hospital such as Tygerberg, a disturbing number of diabetic patients already have advanced retinopathy.

It has been shown that as a group physicians, diabetologists and medical registrars are not sufficiently adept at diagnosing proliferative retinopathy.[2] So that the diagnosis of diabetic eye disease is not missed, ophthalmologists' opinions should be obtained or eye examination skills improved. There seems to be a need for individually tailored educational programmes for primary care physicians as well as increased co-ordination of care across specialties.[2,11] It may be that greater educational emphasis on the diagnosis of proliferative retinopathy during pregraduate and postgraduate medical training would be an effective strategy to ensure optimal patient care.

Loss of vision is always a tragedy, but the sudden onset of blindness secondary to vitreous haemorrhage in a patient who has been completely unaware that he was at risk is particularly devastating. The anger and bewilderment of such a patient is very poignant. The responsibility for the proper education, examination, evaluation and appropriate referral of diabetic patients falls on the shoulders of every member of the health care team. A screening programme such as the one described here should help in the identification and treatment of these patients.

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